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Composition series for GKZ-systems. (English) [Zbl 1445.14033](#)
Trans. Am. Math. Soc. 373, No. 5, 3445-3481 (2020).

V. V. Batyrev [Duke Math. J. 69, No. 2, 349–409 (1993; [Zbl 0812.14035](#))], J. Stienstra [in: Integrable systems and algebraic geometry. Proceedings of the 41st Taniguchi symposium, Kobe, Japan, June 30–July 4, 1997, and in Kyoto, Japan, July 7–11 1997. Singapore: World Scientific. 412–452 (1998; [Zbl 0963.14017](#))], and A. Adolphson [Duke Math. J. 73, No. 2, 269–290 (1994; [Zbl 0804.33013](#))] considered an increasing filtration $W_{\bullet}(A, \beta)$ on the GKZ system $M_A(\beta)$. When β is special, this filtration is related to the mixed Hodge structure of the cohomology of hypersurfaces in a toric variety.

In the article under review, the author studies the question that whether the associated graded pieces of this filtration are semisimple \mathcal{D} -modules. The author constructs canonical epimorphisms from these associated graded pieces to some \mathcal{D} -modules coming from “smaller” GKZ systems, and gives a criterion when these epimorphisms can be made isomorphisms. In particular, he shows that if A is “simplicial relative to β ” and β is “weakly A -nonresonant” (two conditions that are combinatorial in nature), then these associated graded pieces are indeed semisimple \mathcal{D} -modules.

Reviewer: [Dingxin Zhang \(Beijing\)](#)

MSC:

14F10 Differentials and other special sheaves; \mathcal{D} -modules; Bernstein-Sato ideals and polynomials
32S60 Stratifications; constructible sheaves; intersection cohomology (complex-analytic aspects)

Keywords:

GKZ system; \mathcal{D} -module

Full Text: [DOI](#)

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